Claims

1. A modeling material for dental purposes, characterized in that it comprises, preferably as first component, at least one metal and/or at least one metal compound which are able to react chemically with one another and/or with at least one further reactant so as to lead to an increase in volume and, preferably as second component, at least one substance having thermoplastic and/or wax-like properties.

2. The modeling material as claimed in claim 1, characterized in that an increase in the oxidation number of the metal or of the metal of the metal compound occurs in the chemical reaction.

3. The modeling material as claimed in claim 1 or claim 2, characterized in that the further reactant is an oxygen-containing compound or preferably oxygen.

4. The modeling material as claimed in any of the preceding claims, characterized in that the metal or the metal of the metal compound is a transition metal.

5. The modeling material as claimed in claim 4, characterized in that the metal or the metal of the metal compound is a transition metal of the fourth transition group, in particular titanium.

6. The modeling material as claimed in any of the preceding claims, characterized in that the metal compound is a compound of a metal with a nonmetal, preferably a nitride, a carbide or a boride, in particular a nitride.

7. The modeling material as claimed in any of the preceding claims, characterized in that the substance is a wax, preferably at least one paraffin wax.

8. The modeling material as claimed in any of the preceding claims, characterized in that it has a solidification point in the range from 50°C to 80°C, preferably from 55°C to 70°C.

9. The modeling material as claimed in any of the preceding claims, characterized in that it further comprises, preferably as constituent of the first component, at least one glass and/or a glass-ceramic.

10. The modeling material as claimed in claim 9, characterized in that the glass is a silicate glass or the glass-ceramic is derived from silicate glass.

11. The modeling material as claimed in any of the preceding claims, characterized in that it further comprises, preferably as constituent of the first component, at least one oxide-ceramic material.

12. The modeling material as claimed in claim 11, characterized in that the oxide-ceramic material is aluminum oxide.

13. The modeling material as claimed in any of the preceding claims, characterized in that it further comprises at least one additive, in particular at least one dispersant.

14. The modeling material as claimed in claim 13, characterized in that the additive is at least one polyethylene glycol, preferably at least one polyethylene glycol ether.

15. The modeling material as claimed in any of the preceding claims,

characterized in that the proportion of the first component is, based on the total volume of the material, from 30% by volume to 80% by volume, preferably from 50% by volume to 75% by volume.

16. The modeling material as claimed in any of the preceding claims, characterized in that the first component present in the modeling material comprises, based on the total volume of this first component, either from 1% by volume to 100% by volume of titanium nitride, preferably from 3% by volume to 25% by volume of titanium nitride, and from 0% by volume to 99% by volume of oxide-ceramic material, in particular aluminum oxide, preferably from 75% by volume to 97% by volume of oxide-ceramic material, in particular aluminum oxide, or from 1% by volume to 100% by volume of titanium nitride, preferably from 40% by volume to 99% by volume of titanium nitride, and from 0% by volume to 99% by volume of glass or glass-ceramic, preferably from 1% by volume to 60% by volume of glass or glass-ceramic.

17. The modeling material as claimed in any of the preceding claims, in particular claim 16, characterized in that the particle size d_{50} of the metal compound, in particular the titanium nitride, is from 0.5 µm to 8 µm, preferably from 0.5 to 1.5 µm or from 2 to 8 µm.

18. The modeling material as claimed in any of claims 9 to 17, in particular claim 16 or claim 17, characterized in that the particle size d_{50} of the oxide-ceramic material, in particular the aluminum oxide, is from 3 to 5 µm, preferably from 3.5 to 4 µm, or the particle size d_{90} of the glass or the glass-ceramic is less than 80 µm, preferably less than 30 µm.

19. The modeling material as claimed in any of the preceding claims,

characterized in that the first component present in the modeling material comprises, based on the total volume of this first component, either from 1% by volume to 12% by volume of titanium nitride, in particular from 3% by volume to 12% by volume of titanium nitride, having a particle size d_{50} of from 2 to 8 μm and from 88% by volume to 99% by volume of aluminum oxide, preferably from 88% by volume to 97% by volume of aluminum oxide, having a particle size d_{50} of from 3 to 5 μm or from 40% by volume to 60% by volume of titanium nitride having a particle size d_{50} of from 2 to 8 μm and from 40% by volume to 60% by volume of glass or glass-ceramic having a particle size d_{90} of less than 80 μm, preferably less than 30 μm.

20. The modeling material as claimed in any of the preceding claims, characterized in that the first component present in the modeling material comprises, based on the total volume of this first component, either from 10% by volume to 25% by volume of titanium nitride having a particle size d_{50} of from 0.5 to 1.5 μm and from 75% by volume to 90% by volume of aluminum oxide having a particle size d_{50} of from 3 to 5 μm or from 70% by volume to 95% by volume of titanium nitride having a particle size d_{50} of from 0.5 to 1.5 μm and from 5% by volume to 30% by volume of glass or glass-ceramic having a particle size d_{90} of less than 80 μm, preferably less than 30 μm.

21. The modeling material as claimed in any of claims 13 to 20, characterized in that the additive is present in an amount based on the particle surface area of metal and/or metal compound and, if present, glass, glass-ceramic and/or oxide-ceramic material of from about 0.5 to 10 mg, preferably from 1 to 4 mg, per m^2 of particle surface area.

22. The modeling material as claimed in any of the preceding claims, characterized in that the linear expandability of the material is in the range from 3 to 50%, preferably from 5 to 30%, in particular from 10 to 25%.

23. The modeling material as claimed in any of the preceding claims, characterized in that it is in the form of granules, preferably in the form of largely droplet-shaped granules.

24. The modeling material as claimed in claim 23, characterized in that the diameter of the granules is in the range from 2 to 20 mm, preferably from 5 to 15 mm.

25. The modeling material as claimed in any of the preceding claims, characterized in that it can be stored in the solidified state, in particular in packaging which can be closed in an airtight fashion.

26. A process for preparing the modeling material as claimed in any of the preceding claims, characterized in that a first component comprising at least one metal and/or at least one metal compound which can react chemically with one another and/or with at least one further reactant so as to lead to an increase in volume, if desired after addition of at least one glass-ceramic, a glass and/or an oxide-ceramic material, is dispersed with a second component comprising at least one wax, if desired after addition of at least one additive.

27. The use of the modeling material as claimed in any of claims 1 to 25 for producing preferably all-ceramic shaped dental parts, wherein the sintering shrinkage occurring on sintering of a green ceramic body formed on a working model is at least partly, preferably completely, compensated by the expansion of the

modeling material in the production of the working model.

28. A process for producing a dental model, in particular a working model, characterized in that the modeling material as claimed in any of claims 1 to 25 is introduced into a negative mold of a tooth preparation or of a prosthetic buildup part and a chemical reaction which proceeds with an increase in volume of the material is initiated and carried out.

29. The process as claimed in claim 28, characterized in that the reaction is an oxidation, preferably an oxidation by means of oxygen, in particular atmospheric oxygen, as further reactant.

30. The process as claimed in claim 28 or claim 29, characterized in that the reaction is initiated and carried out by means of a thermal treatment which is preferably carried out at temperatures in the range from 200°C to 1250°C.
